M013c: RAPPELS

TSP Number/Title	M013c:Rappels
Effective Date	Implement next class iteration upon receipt
Supersedes TSP(s)/Lessons	None
TSP User	The following courses use this TSP: Mountain Instructor Qualification Course (MIQC) Basic Mountaineering Course (BMC) Assault Climber Course (ACC)
Proponent	United States Army Alaska, Northern Warfare Training Center
Improvement Comments	Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: ATTN: TRAINING ADMINISTRATOR COMMANDANT USARAK NWTC 1060 GAFFNEY ROAD #9900 FORT WAINWRIGHT AK 99703-9900
Security Clearance/Access	Public domain
Foreign Disclosure Restrictions	The Lesson Developer in coordination with the USARAK NWTC foreign disclosure authority has reviewed this lesson. This lesson is releasable to foreign military students from all requesting foreign countries with Approval of Commandant USARAK NWTC.

PREFACE

Purpose

This training support package provides the instructor with a standardized lesson plan for presenting instruction for:

Task Number	Task Title
VIII.0830.01	Rope Installations

Technique of Delivery

Lesson Number	Instructional Strategy	Media
M013C	Class	None

This TSP contains

SECTION I

ADMINISTRATIVE DATA

All courses including this lesson

Course Number	Course Title
NA	Mountain Instructor Qualification Course
NA	Basic Mountaineering Course
NA	Assault Climber Course

Task(s) Taught or Supported

Task Number	Task Title
VIII.0830.01	Establish a rappel point
VIII.0803.02	Rig a retrievable rappel
VIII.0830.03	Perform a hasty rappel
VIII.0830.04	Perform a body rappel
VIII.0830.05	Tie a rappel seat
VIII.0830.06	Perform a carabiner wrap rappel
VIII.0830.07	Rappel using a figure eight descender
VIII.0830.08	Rappel using a “tuber” device
VIII.0830.09	Demonstrate a temporary tie-off while rappelling
VIII.0830.10	Perform a multi pitch rappel
VIII.0830.11	Pass knots while rappelling
VIII.0830.12	Retrieve a rappel rope

Task(s) Reinforced

Task Number	Task Title
VI.0200	Risk Management for Mountain Operations
VIII.0200	Mountaineering Equipment
VIII.0300	Rope Management and Knots
VIII.0400	Anchors

Prerequisite Lesson(s)

-M005, M006, M007, M008, M009, M010, M011, M012

References

Number	Title	Date	Additional Information
FM 3-97.6	Mountain Operations	NOV 00	
FM 3-97.61	Military Mountaineering	AUG 02	
NA	USARAK NWTC Mountain Operations Manual	FY 2003	
NA	Risk Management for Mountain Operations	FY 2003	

Student Study Assignment

Read M013c

Instructor Requirements

One Small Group Leader TAITC, and Mountain IQC qualified.

Additional Support Personnel Requirements

None

Equipment Required

Instructor Equipment:

- Mountaineering Helmet
- 1 rope, static kernmantle, 11mm x 50m
- 1 rope, dynamic kernmantle, 11mm x 50m
- 1 piece of webbing, 1” x 9.5ft or 25ft

- 1 cordelette
- 1 locking carabiner
- 1 steel locking D-carabiner
- 4 non locking steel oval carabiners
- 1 dynamic rope, 11mm x 16ft

Student Equipment:

- Mountaineering Helmet
- 1 rope, static kernmantle, 11mm x 50m
- 1 rope, dynamic kernmantle, 11mm x 50m
- 1 piece of webbing, 1” x 9.5ft or 25ft
- 1 cordelette
- 1 locking carabiner
- 1 steel locking D-carabiner
- 4 non locking steel oval carabiners
- 1 dynamic rope, 11mm x 16ft
- Pen and notepad

Materials Required

Instructor Materials:

- TSP
- NWTC Mountain Operations Manual
- Risk Management for Mountain Operations

Student Materials:

- NWTC Mountain Operations Manual
- Risk Management for Mountain Operations

Classroom, Training Area and Range Requirements

Mountaineering training/testing area large enough to facilitate 8 students working in pairs and SGL. Training area must have adequate routes with natural anchors to facilitate simultaneous installation of 4 rappel points.

Ammunition Requirements

None

Instructional Guidance

Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material.

Branch Safety Manager Approval

NAME	Rank	Position	Date
Mark Gilbertson	**GS-09**	**Training Specialist**	

Proponent Lesson Plan Approvals

NAME	Rank	Position	Date
Peter Smith	**GS-12**	**Training Administrator**	

SECTION II **INTRODUCTION**

Method of instruction: Small Group
Type of instruction: Class
Instructor to student ratio: 1:8
Time of instruction: 2 hours
Media used: None

Motivator

A climber can quickly descend a steep slope by means of a rappel. This means sliding down a rope which has been attached to a bombproof anchor, controlling speed by friction against the rope. You will learn to establish a rappel point, operate, and recover the system. Safety is always the primary concern as rappelling has contributed to many mountaineering accidents.

Terminal Learning Objective

ACTION:	Set up a rappel point and demonstrate rappels
CONDITION:	Given 1 or 2 climbing ropes for the setup, a rack with adequate hardware and sling material, and appropriate terrain for rappel techniques
STANDARD:	Set up a rappel point and demonstrate rappels IAW NWTC Mountain Operations Manual.

Safety Requirements

Ensure that students:

- Receive a risk assessment prior to movement to the training area and before practical exercises.
- Have all necessary equipment for the PE's, to include any additional equipment required by the NWTC SOP.
- Have two full canteens and drink adequate water to avoid becoming dehydrated.
- Receive a briefing on the symptoms of heat injury or cold weather injury, as appropriate.

Risk Assessment Level

Determined by instructor

Environmental Considerations

None

Evaluation

Instructional Lead-in

You have already mastered the skills of rope management and knots, rigging natural anchors, tying to the climbing rope, basic belays, and climbing. You will now use a combination of these skills to learn how to properly install, operate and recover a rappel point.

SECTION III **PRESENTATION**

ELO A

ACTION:	Establish a rappel point
CONDITION:	Given 1 or 2 climbing ropes for the setup, a rack with adequate hardware and sling material, and appropriate terrain for rappel techniques
STANDARD:	Establish a rappel point IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Establishing a Rappel Point

The climber must be conscious of the route that the rappel will follow; he must insure that the rope will reach the bottom or a place from which further rappels will reach the bottom of the rock. The selection of the anchor is of critical importance. The anchor must be tested carefully. Ideally, the anchor should be higher than the loading platform. The loading platform should be cleared of all loose rocks which could be knocked off and be big enough to accommodate the rappeller and the person controlling the platform. Natural anchors are preferred over artificial ones, however, if no natural anchors are available then one of the artificial anchors described in this text must be devised.

NOTE: For training purposes two anchors are recommended, a primary and a secondary.

ELO B

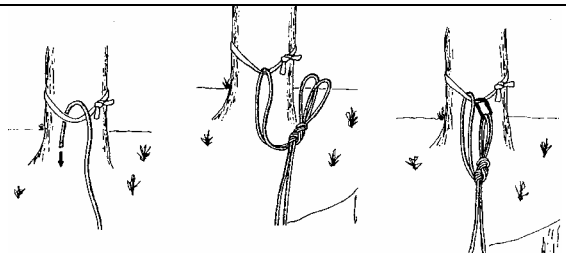
ACTION:	Rig a retrievable rappel
CONDITION:	Given 1 or 2 climbing ropes for the setup, a rack with adequate hardware and sling material, and appropriate terrain for rappel techniques
STANDARD:	Rig a retrievable rappel IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Rigging a Retrievable Rappel

When rigging a retrievable rappel after the anchor is established, route or thread the rope through all of the anchor slings or other rigging so that the middle of the rope is resting on the sling. Separate and stack the rope in two piles.

The next step is to S-fold the rope in preparation for throwing. To insure that the rope will not snarl when thrown it will be necessary to manage it carefully. Take the ends of the rope off the top of the piles. Next, begin S-folding the rope from the end back toward the anchor. This will work any kinks out of the rope as it is coiled. When the rope is completely coiled, place the coils in the throwing hand. Separate the last four to six coils of the running end from the main coil and hold them in the other hand. When throwing the rope, the main coil will be thrown first. A few preliminary swings will ensure a smooth throw. The swings should be made with the arm nearly extended with the coil being thrown up and out. A slight twist of the wrist, so that the palm of the hand faces up, as the rope is thrown will allow the coils to separate easily, without tangling. A smooth follow through is essential. During the follow through, the remaining 4 to 6 coils held in the other hand should be tossed out. This technique keeps the running end from tangling around the main coil. As soon as the rope leaves the hand, the thrower shouts the warning "ROPE!" to alert anyone below. Pull up excess slack, if any, so that there is approx. 1 meter of rope is remaining on the unloading platform; stack the excess behind the loading area. Tie a figure eight on doubled rope, connect the loops of the figure eight to the sling(s) with opposed carabiner or a locking carabiner. Ensure all knots are to the rear of the loading platform.

CAUTION: ENSURE YOU ARE ANCHORED BEFORE YOU START THE THROW.



A **B** **C**

Rappel Point

NOTE: If two ropes have been joined, the connecting knot must be located on the rope part going through the anchor, between the anchor and the figure eight.

NOTE: If the unloading platform cannot be observed tie both ends of the rope together to prevent a rappeller from sliding off the rope should the ends not reach a suitable unloading platform.

ELO C

ACTION:	Perform a hasty rappel
CONDITION:	Given a retrievable rappel that has been rigged to standard.
STANDARD:	Perform a hasty rappel IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Perform a Hasty Rappel

Hasty Rappel: This rappel should only be used on moderate pitches. Facing sideways to the anchor point, the rappeller places the rope across his upper back and underneath his arms. The hand nearest to the anchor is his guide hand and his hand pointing downhill is his brake hand. To stop, the rappeller brings his brake hand across his chest locking the rope, and at the same time he turns up toward the anchor point. Its main advantage is that it is easier and faster than the other methods. Its main disadvantage is that the friction that controls descent is totally dependent on the muscles of the rappeller's hands; hence steep descents must be avoided.

Hasty Rappel

ELO D

ACTION:	Perform a body rappel
CONDITION:	Given a retrievable rappel installed to standard
STANDARD:	Perform a body rappel IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Perform a Body Rappel

This rappel should not be used on overhanging terrain. The individual faces the anchor point and straddles the rope. He then pulls the rope from behind, runs it around the either hip, then diagonally across the chest and back over the opposite shoulder. From there, the rope runs to the brake hand which is on the same side of the body as the hip that the rope crosses; for example, for a right hand brake, the rope should come from the anchor point between the rappeller's legs, around the right hip, across the chest to the left shoulder, and then across the back to the right (brake) hand. The rappeller should lead with the brake hand down and should face slightly sideways. The foot corresponding to the brake hand should precede the other at all times. The other hand should be slightly above the rappeller, and is used only as a guide, never as a brake.

NOTE: CAUTION: DO NOT RELEASE THE GUIDE HAND FROM THE ROPE. A FALL BACKWARDS AND A COMPLETE UNWINDING FROM THE ROPE WILL OCCUR RESULTING IN AN UNCONTROLLED FALL. BENDING AT THE WAIST WILL RESULT IN ALL SLACK COMING OUT OF THE ROPE AND LOCKING THE RAPPELLER IN THIS POSITION.

The rappeller must lean out at a sharp angle to the rock, keeping his legs well spread and relatively straight for lateral stability, and his back straight in order to reduce unnecessary friction. The collar should be turned up to prevent rope burns to the neck. Other articles of clothing may be used as padding for the shoulders and buttocks. To brake, turn and face directly into the rock so that the feet are horizontal to the ground, and bring the brake hand across the chest.

Body Rappel

Note: Ensure the running ends do not cross.

ELO E

ACTION	Tie a rappel seat
CONDITION	Given a 16ft sling rope
STANDARD	Tie a rappel seat IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Rappel Seats

The seat rappel differs from the body and hasty rappel in that most of the friction is absorbed by a carabiner or friction device which is inserted to the front of an improvised rappel seat. This method provides a faster descent with less friction on the body than the other methods. Gloves can be worn to prevent rope burns.

Tying the rappel seat; find the center of a 16 foot rope and place the bight at waist level on the guide

hand hip. Reach behind and grasp one running end and bring it to the front and tie a double overhand knot. Run both ropes between the legs ensuring they don't cross. Pass the ends up under the waist rope and tie a half hitch around the waist rope with the running ends routed from the center out. Wrap the running ends around the waist and secure with a square knot on the guide hand hip. Tuck any tails into the trouser pocket. Two non-locking steel oval carabiners are inserted through all waist loops (gates opposite and opposed). A large steel locking carabiner is then inserted into the steel oval carabiners with the gate facing away and to the left (for a right hand brake hand – large steel oval is inserted away and to the right for a left hand brake hand). The dual opposed gate carabiners are used to ensure that the rappel rope is away from the body and does not interfere with any equipment on the body. These carabiners also prevent the rappel rope from coming in contact with the rappel seat.

Rappel Seat

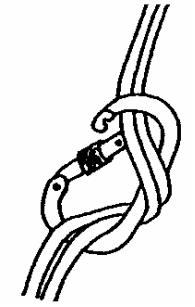
ELO F

ACTION	Perform a Carabiner wrap rappel
CONDITION	Given a retrievable rappel installed to standard
STANDARD	Perform a Carabiner wrap rappel IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Rappelling in a Rappel Seat

The rappeller stands facing the rappel rope with the intended guide hand toward the anchor. Insert both ropes into the carabiner. Then take some slack between the carabiner and the anchor point and pull it underneath, around and over the solid part of the carabiner and insert it again. This results in a turn of rope around the solid shaft of the carabiner which does not cross itself when under tension. When using single rope, insert in the same manner as described above, but use two wraps around the carabiner to increase friction. Ensure the gate is locked. Facing slightly sideways, the climber descends using his upper hand as the guide hand and the lower hand as the brake hand. The rope is grasped by the brake hand with the thumb pointing up the rope toward the body. The braking hand is held behind and slightly above the hip. Braking action is obtained by closing the hand and pressing the rope into the small of the back. When rappelling with heavy loads, or any time that extra friction is desired, the rope may be passed from the carabiner around the hips to the opposite hand, with the brake being applied as in a sitting hip belay. The rappeller should lean well out from the rock and make a smooth descent. If the rope is not inserted into the carabiner correctly, there is a strong possibility of the gate being opened and the rope coming out. The rope running through the carabiner in this manner can twist the rope, and at times is difficult to remove from the carabiner. When using laid rope, a rappeller using a left hand brake will cause the rope to twist even more so since he is applying pressure against the lay of the rope. For this reason it is advisable to have all personnel use a right hand brake. Loose

clothing or equipment can work itself into the carabiner locking the rappeller to the rope. Should this happen in the middle of a cliff, it can be extremely difficult to extricate the rappeller. Each man must be checked to insure that he is properly connected to the rappel rope and that he has no equipment or clothing hanging loose which could become jammed in the carabiner. A belay man can be used for safety in this rappel. A person “on rappel” can be immediately halted by pulling the rappel rope tight at the bottom.



"Carabiner wrap"

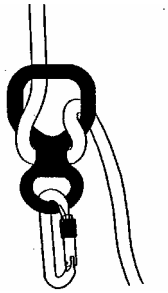
ELO G

ACTION	Rappel using a figure eight descender
CONDITION	Given a retrievable rappel installed to standard
STANDARD	Rappel using a figure eight descender IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Rappelling using a Figure Eight Device

An alternative to the carabiner wrap rappel technique is to use a figure 8 descender. The figure 8 puts fewer kinks into the rope than the carabiner wrap and works especially well with kernmantle ropes. Kernmantle ropes often turn into a tangled mess if a carabiner wrap is used.

To rig the figure 8 for rappelling, a bight is placed into the rope and run through the “large eye” of the 8. The bight is then placed over and around the “small eye”. The “small eye” is then clipped into the locking carabiner attached to the rappel seat. The guide hand goes on the rope running to the anchor. The brake hand goes on the slack rope exiting on the 8 on the opposite side. The brake hand is raised allowing the rappeller to descend. The brake is applied by pulling the rope down, toward the ground, with the brake hand. A belay man can also be used at the bottom for safety in this rappel. The figure 8 descender can be used on both single rope and doubled rope rappels.



Routing of the Rappel Rope Through a Figure 8 Descender

ELO H

ACTION	Rappel with a “tuber” device
CONDITION	Given a rappel point installed to standard
STANDARD	Rappel with a “tuber” device IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Rappelling using a Tuber Device

Another alternate to the carabiner wrap rappel technique is a “tuber” device. A tuber device puts fewer

kinks in the kernmantle rope like the figure 8.
To rig a tuber device for a rappel, a bight is put through the “small” end of the device. The “large” end and the rope is then clipped into the locking carabiner attached to the rappel seat. The guide hand goes on the rope running to the anchor. The brake hand goes on the rope that runs toward the ground below. The brake hand is raised to allow the rappeller to descend. The brake is applied by pulling the rope down, toward the ground, with the brake hand. A belay man can also be used at the bottom for safety in this rappel. The “tuber” device can be used on both single and double rope rappels.

ELO I

ACTION	Demonstrate a temporary tie off during rappelling
CONDITION	Given a retrievable rappel point installed to standard
STANDARD	Demonstrate a temporary tie-off during rappelling IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Tying Off During a Rappel

It may be necessary to stop during a rappel and perform some work along the rappel pitch. When using a seat rappel, this may be accomplished by first applying the brake. Then grasp the slack rope with the guide hand and make three or more round turns or wraps around your “guide hand side” leg, always maintaining your brake. Slowly release the tension from your brake onto the leg wraps. The friction of the leg wraps will hold you in place as you work with your hands. When you are ready to continue the rappel, first regain your brake with the brake hand. Use your guide hand to slowly unwrap the leg wraps and put tension back on the brake hand. When completely unwrapped from the leg wraps, continue the rappel.

ELO J

ACTION	Perform a multi-pitch rappel
CONDITION	Given a rappel point installed to standard on a two-pitch slope
STANDARD	Perform a multi-pitch rappel IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Multi-Pitch Rappels

A descent route often involves a series of rappels and could present special problems and require maximum efficiency to keep the party on the move. The trickiest is a rappel into the unknown, down a route you are not familiar with. Avoid this kind of multiple rappel. If you can, find a photo of the route before you leave to climb and bring it with you. If you can not see the bottom of an unfamiliar rappel pitch, the first person down has got to be prepared to climb back up the rope in case the rappel leads nowhere. (using prusik or other rope ascension devices). It is also a good idea to tie knots into the ends of the rope to avoid rappelling off the ends of the rope. Rappelling down unfamiliar terrain brings an increased risk of getting the rope hung up. You might consider rappelling using one rope, even if two ropes are available, because one rope is easier to retrieve and less likely to hang up than two. Even though it is nice to gain maximum distance from each rappel, don’t bypass a good rappel point even 40 feet or so from the end of the rope if there are doubts about finding a good place farther down. As a party moves through a series of rappels, the first person down each pitch usually carries gear to use in setting up the next rappel (after tying into an anchor at the bottom). The more experienced climbers in the party can take turns being first and last, while it’s best for the beginners to be somewhere in the middle.

ELO K

ACTION	Pass knots while rappelling
CONDITION	Given a rappel point with two ropes tied together installed to standard.
STANDARD	Pass knots while rappelling IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 -Passing a Knot in a Rappel Rope

When rappelling a multi-pitch, if the double fisherman knot is not stacked in the pile of rope between the anchor and the figure-eight knot, or if a knot is put in the rope by a twist the rappeller must pass it to continue. First you need to attach a cordalette to the climbing rope above the rappel device with a prusik knot, take a carabiner and secure it to your climbing harness, clip the prusik into the carabiner, tighten the prusik knot down onto the climbing rope. Ease the tension onto the prusik to ensure it secures you in place, once you're secure, unclip the climbing rope from your rappel device and pass the knot so it is above the spot in the rope where you need to hook back up to the climbing rope. Now hook up to the climbing rope ensuring that the knot is above the rappel device. Once you have hooked up reestablish your brakehand, use the prusik to help you take the slack out of the rope then remove the prusik from the rope and continue your rappel.

ELO L

ACTION	Retrieve a rappel rope
CONDITION	Given a retrievable rappel point installed to standard
STANDARD	Retrieve a rappel rope IAW the NWTC Mountain Operations Manual.

Learning Step Activity 1 - Retrieving a Rappel Rope

In order to insure that the rappel rope can be retrieved after the last man is down, it will normally be necessary to use a doubled rope or two ropes connected. For short rappels, a single rope may be doubled; for longer rappels it may be necessary to tie two ropes together using a double fisherman's knot. If two ropes must be used, the connecting knot will be placed to one side of the anchor.
The last man to rappel will remove the figure 8 knot from the rope and retrieve any equipment left at the loading platform. He will ensure that the middle of the rope is resting on the sling and execute the rappel. Once at the bottom of the pitch the rope is pulled smoothly out of the anchor sling.
If two ropes were used, the rope must be pulled from the side with the knot. In this way the knot will not have to go through the anchor, preventing a likely hang-up of the rope. The rope should be pulled smoothly to prevent the rising end from whipping around the anchor or other objects and getting caught. Everyone should stand clear of the falling rope. The warning "ROPE" should be given as the rope passes around the anchor point and begins to fall.

Rappelling is deceptively dangerous due to its apparent ease and dependence on equipment. Above all, common sense, good judgment and a slow methodical approach are required. It is imperative that each man rappel smoothly without jumping, bounding, or making sudden stops as these practices put an excessive strain on the rappel anchor. Many personnel may be apprehensive about rappelling, especially for the first time off a vertical face. It is important to minimize their fear so they may develop confidence in their equipment and technique. It is advisable, especially during training rappels, to establish a separate belay for the rappeller at the rappel point. A second climbing rope secured to the climber and run through a Munter hitch or hip belay at the top provides this additional safety.

SECTION IV **SUMMARY**

Method of instruction**:** SG
Technique of instruction: CO
Instructor to student ratio: 1:8
Time of Instruction: 01:55 to 02:00
Media used: None

NOTE: Let the students know that these tasks are not tested individual, however will be tested during other tasks.

Check on Learning

a. What kind of anchors are preferred, when establishing a rappel point?
Natural anchors.

b. Ideally where should the anchor be located?
Higher than the loading platform.

Terminal Learning Objective

ACTION:	Set up a rappel point and demonstrate rappels
CONDITION:	Given 1 or 2 climbing ropes for the setup, a rack with adequate hardware and sling material, and appropriate terrain for rappel techniques
STANDARD:	Set up a rappel point and demonstrate rappels IAW NWTC Mountain Operations Manual.

Transition to next lesson

If applicable

SECTION V	STUDENT EVALUATION
Testing Requirements	**Students will be tested on this task during the Mountain Stakes portion of training as per the NWTC training schedule for this course.**
Feedback Requirement	**Students will receive two opportunities to pass each event tested. Re-training will be conducted for students that fail the first iteration of testing. Refer to M020 for specifics.**